Preliminary Monitoring Plan for Phased TMDLs in Bull Creek, Levisa Fork, Pound River and Powell River

Public Meeting
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Phased TMDLs

- Bull Creek
  - Sediment (TSS) and Total Dissolved Solids (TDS)
- Levisa Fork
  - TSS and PCBs
- Powell River
  - TSS
- Pound River
  - Lower North Fork Pound
    - TSS
  - South Fork Pound
    - TSS and TDS
  - Phillips Creek
    - TSS and TDS

Why are we here tonight?

- Phased TMDLs
  - Concern over the data available and the modeling results during TMDL development.
- Process
  - "Phase I" TMDLs
    - Effective for 2-years
  - Additional monitoring
  - Develop "Phase II" TMDL

Questions

- All TMDLs
  - What sediment loads are discharged during storm events?
- Bull & Pound TMDLs
  - What is the annual contribution of TDS from the abandoned underground mine workings?
  - What percentages of the total TDS waste load are attributable to
    - Background?
    - current mine activity?
    - groundwater?
- Pound TMDL
  - How much of the TDS waste load assigned to the active mines is a result “Rahall” eligible discharges?

Questions

- Bull TMDL
  - How much do the existing straight pipes contribute to the stream's impaired aquatic life?
- Powell TMDL
  - Should PAH be considered as a probable stressor?
  - What are the sources of the PAHs in the watershed?
- Levisa TMDL
  - What are the specific sources of the PCBs in the watershed?

Three Types of Questions

- General Modeling Support
  - Directly applicabl to the TMDL
  - May be applicable to multiple TMDL areas
- Stressor Identification Support
  - May impact the TMDL
  - Might only affect Implementation strategies
- Implementation Support
  - May affect implementation approaches
  - Probably won't affect the TMDL

Storm Sediment Question

(General Modeling Support)

- Automated samplers at pond outlets
  - Rain gages
  - Stage measurement
- Sampling triggered by rainfall/stage
- Flow weighted composite samples
- Continue semi-monthly grab samples
- Number of sites to be determined

TDS from Mine Workings

(General Modeling Support)

- Within Bull Creek, well-defined discharges from abandoned underground mine workings
  - Flow from these discharges is considered to be relatively stable
- Flow and TDS will be measured on a fixed frequency (e.g., monthly or quarterly)
- Conductivity and depth of flow monitored continuously
- Relate loads of TDS to the expanse (e.g., area or volume) of the mine workings
- Potential for the data to be extrapolated for use in other watersheds.

TDS from Mine Workings

(General Modeling Support)

- Alternative plan
  - Where/if discharges from abandoned underground mine workings are not well defined
  - Record the average TDS level in the mine workings (TDS_M) and in unaffected groundwater (TDS_{GW})
  - Use these values in conjunction with TDS (TDS_S) and flow (Q_S) monitoring in the stream to calculate the TDS loads for mine workings and groundwater

$$Q_S \times TDS_S = Q_M \times TDS_M + Q_{GW} \times TDS_{GW}$$

and

$$Q_S = Q_M + Q_{GW}$$

TDS Waste Load Characterization

(Implementation Support)

- Percentages of TDS from active mining attributable to
  - Background?
  - Current mine activity?
  - Groundwater?
- Results will not likely impact the TMDL
  - Lower priority, unless alternative/additional funding sources identified
- "Background" loads could be monitored at an upstream location
- Groundwater can be assessed using the approach outlined in the previous slide

TDS from Remining (Rahall)

(Implementation Support)

- Results will not likely impact the TMDL
  - Lower priority, unless alternative/additional funding sources identified
- Site specific approach
- If discharges are from underground mines, then use the techniques suggested for quantifying the TDS load from abandoned underground mine workings.
- If discharges from surface disturbances, then isolate the impact from these disturbances through monitoring upstream and downstream or, where possible, by monitoring discharges from the disturbed area itself.

Straight Pipes and Failing Septic

(Stressor Identification Support)

- Since straight pipes contribute TSS and TDS to the stream, this may be merely an implementation question.
- If specific pollutants associated with straight pipes are identified, the TMDL could change.
- VDH study at Stonega, could provide insight.
- Benthic assessments combined with fluorometric analysis and estimates of straight pipe numbers would help identify a specific relationship between straight pipes and poor benthic health.

PAHs as Probable Stressor

(Stressor Identification Support)

- High PAH levels in sediment samples were identified as a possible stressor.
- Predominant form of PAH was naphthalene, a highly volatile substance:
  - Burning of wood & fossil fuels
  - Tar camphor
  - Mothballs & moth flakes
  - Coal & petroleum
- Naphthalene is usually gone from rivers or lakes within two weeks.
- It binds very weakly to soil and sediments.
- There is either an active, widely distributed source of naphthalene, or the detected naphthalene is bound-up in coal sediments that are not bio-available.
- Bioavailability Testing
  - Benthic macroinvertebrate tissues from areas with high/low levels of naphthalene analyzed for naphthalene.
  - Significantly higher values in the fauna from sites with high naphthalene values would indicate bioavailability.

PCBs (Levisa) and PAHs (Powell)

(Implementation Support)

- Results will not likely impact the TMDL
  - Lower priority, unless alternative/additional funding sources identified
- Use monitoring conducted during the TMDL development as a starting point
- Identify specific locations where additional monitoring of the PCBs or PAHs in sediments could help to prioritize the search for pollutant sources.

Monitoring Prioritization

- High Priority
  - Sediment Monitoring
  - Underground Mine TDS Monitoring
  - Review VDH Straight Pipe Study
  - Fluorometric Analysis (Straight Pipes)
  - PAH (Naphthalene) Bioavailability Testing
- Low Priority
  - TDS Waste Load Characterization
  - Remining (Rahall) Study
  - Sources of PAHs and PCBs

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